account the fallibility of the corrections which he introduces, this gives us

$$\pi = 0''\cdot747$$

with a probable error of $\pm 0''\cdot023$, as far as it is possible to estimate the probable error at all.

The principal results of this examination are, therefore—

(1) That there appear to be errors affecting each group which are *not* those found by Dr. Gill, and that the evidence is by no means conclusive that they are constant in each group, but that, on the contrary, there is a presumption in favour of a systematic error affecting the separate values of the parallax as deduced from the various groups.

(2) That Dr. Gill's method is inadmissible and his probable error underestimated.

(3) That the most probable value of the parallax as deduced from this series of measures on the assumption of constant errors seems to be $0''\cdot77$, and that the introduction of the correction for chromatic dispersion reduces the value of π from $0''\cdot82$ given by the general solution to $0''\cdot78$ or to within $0''\cdot01$ of this value.

And (4) That the value of π found by Dr. Gill, viz.—$0''\cdot747$, cannot by any logical process be deduced from this series of observations.

The Effect of Latitude Variation on the Ecliptic Investigation. By W. G. Thackeray.

In a former paper, *Monthly Notices* liv. 7, p. 417, Mr. Dyson and myself called attention to the important effect that an error of the nature of Chandler's latitude variation would have on the values derived for the correction to the right ascensions of all stars, or to the value of the obliquity according as its maximum or minimum was near the equinoxes or solstices.

The latitude variation as determined by Dr. Chandler is the resultant of two periods, one annual, the other of about 427 days, varying slightly in period and amplitude, the value of which for Greenwich is determined from the expression (*Astronomical Journal*, xv. 360)—

$$\phi_1 - \phi_0 = r_1 \cos (t - \tau_1)\, \theta + 0''\cdot11 \cos \odot.$$

where ϕ_1 and ϕ_0 are respectively the values of the instantaneous and mean latitude.

$$\tau_1 = 2402327 + 428\cdot6\ \mathrm{E.} + 55 \sin \psi.$$
$$r_1 = 0''\cdot135 + 0''\cdot050 \sin \psi.$$
$$\psi = (t - 2402327)\ 0^\circ\cdot015.$$
θ = the longitude of the fictitious or mean Sun.

Here also will be found a small table giving the values of τ_1, r_1, and θ for each value of E. for the years 1888–1900, and the latitude variation for every 20 days for the years 1893–1896 : in *Astronomical Journal*, xvii. 392, is a table of latitude variation for 1897, and in *Astronomical Journal*, xviii. 426, one for 1898.

In the following table are given latitude variations for the middle of each month as corrections to North Polar distances for the years 1890–1898, the factor for converting the corrections into ecliptic North Polar distance, and in the last column the correction for the annual term alone ($+0''\cdot11 \cos \odot$).

Table of Corrections to N.P.D.'s for Latitude Variation for the Middle of each month for the years 1890–1898.

Day.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	Factor.	Annual Term.
	″	″	″	″	″	″	″	″	″		″
Jan. 15	+·21	+·18	+·06	−·06	−·10	−·04	+·08	+·17	+·18	·98	−·05
Feb. 14	+·22	+·25	+·17	+·04	−·05	−·04	+·06	+·16	+·22	·94	−·09
Mar. 15	+·18	+·27	+·24	+·13	·00	−·04	+·02	+·13	+·22	·92	−·11
April 15	+·09	+·21	+·25	+·19	+·05	−·03	−·03	−·06	+·17	·93	−·10
May 15	−·01	+·12	+·21	+·19	+·08	−·03	−·08	−·03	+·08	·97	−·06
June 15	−·12	−·01	+·13	+·16	+·09	−·02	−·12	−·12	−·03	1·00	−·01
July 15	−·21	−·14	+·02	+·10	+·09	−·02	−·13	−·18	−·14	·99	+·04
Aug. 15	−·22	−·20	−·07	+·02	+·06	·00	−·11	−·21	−·21	·94	+·06
Sept. 15	−·24	−·27	−·19	−·06	+·03	+·02	−·07	−·18	−·24	·92	+·11
Oct. 15	−·17	−·24	−·24	−·12	·00	+·04	−·01	−·10	−·21	·93	+·10
Nov. 15	−·07	−·17	−·23	−·15	−·02	+·07	+·07	−·02	−·13	·97	+·06
Dec. 15	+·07	−·04	−·17	−·14	−·04	+·08	+·13	+·10	−·02	1·00	+·01

Assuming that the error in ecliptic North Polar distance can be represented by the expression—

$$x \times \cos \text{Sun's longitude} + y \times \text{Sun's longitude} + z,$$

and that the Sun's observations for each month can be fairly represented by the middle date of each month, then giving equal weights to each month, it is easy to show that Dr. Chandler's annual term alone produces the following corrections :—

$$x = -0''\cdot10$$
$$y = \cdot00$$
$$z = \cdot00$$

The right ascensions of all stars therefore require to be diminished by $\frac{0^s\cdot10}{15 \sin \epsilon}$ or $0^s\cdot016$. This quantity is a constant for all years.

In the same way it can be shown that the effect of the 427-day period for the years 1890–1898 is as follows :—

	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.
	″	″	″	″	″	″	″	″	″
x =	−·09	−·15	−·11	+·01	+·11	+·14	+·07	−·04	−·13
y =	+·12	+·03	−·10	−·13	−·08	+·03	+·11	+·12	+·05
z =	+·02	−·01	−·01	−·02	−·02	·00	+·02	+·02	+·01
	s	s	s	s	s	s	s	s	s
$\frac{x}{15 \sin \epsilon}$ =	−·016	−·026	−·019	+·001	+·018	+·023	+·011	−·007	−·022

The effect of the 427-day period is therefore to produce a seven-year period in the observed corrections to the right ascensions of the stars derived from the observations of the Sun, as also in the deduced value of the obliquity (y) similar in amplitude, but varying in epoch, whereas z or the observed distance from the pole to the ecliptic, is not sensibly disturbed.

The 427-day period, as determined by Dr. Chandler, is liable to small fluctuations in amplitude and period, and therefore the above corrections are liable to similar changes for other dates.

On the "Two-Method" Personal Equation.

By Walter W. Bryant.

For several years past it has been part of the routine at Greenwich for the transit observer for the night to observe occasional clock-stars by the eye-and-ear method, so that, in the event of a breakdown of the chronograph or of the observing circuit, all the observers might be in sufficient practice to be able to take good observations by the older method, and also that their personal equations, when using that method, might be approximately known.

Before 1892 it was the rule to deduce a separate clock-error from stars observed eye-and-ear (generally not more than two by one observer on the same night), and to compare this with the clock-error deduced from all the galvanic observations of clock-stars on the same night by the same observer. But as this involves an extra element of uncertainty in the comparison, it was decided in 1892 to compare only the observations made of the same star by the two methods on the same night, thus at once very much simplifying the comparison, and eliminating instrumental error.

Professor Safford has already made use of some of the results in papers presented to the Society, but, as my investigation starts from a different point, and as I am enabled, by the permission of the Astronomer Royal, to include some hitherto unpublished